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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
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CHICAGO, IL 60604-3590

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REPLY TO THE ATTENTION OF: 6446.6

LIBRARY

Mr. Johnny W. Reising
United States Department of Energy
Feed Materials Production Center
P.O. Box 398705
Cincinnati, Ohio 45239-8705

RE: RTRAK Applicability Study

Dear Mr. Reising:

The United States Environmental Protection Agency (U.S. EPA) has completed its review of the United States Department of Energy's (U.S. DOE) RTRAK applicability study.

This document provides the results of the recent studies of the Radiation Tracking System (RTRAK) and discusses its potential for determining the activities of radionuclides of concern in soil.

U.S. DOE has not adequately addressed the limitations of the technology associated with its use for the soils project. The RTRACK applicability study does not provide a thorough justification for using it to evaluate waste acceptance criteria. U.S. EPA has attached comments on the document.

Therefore, U.S. EPA disapproves the RTRAK applicability study. Given the nature of these comments, U.S. EPA recommends a meeting to discuss a path forward for the use of RTRAK in future soils projects and revision of this document.

Please contact me at (312) 886-0992 if you have any questions regarding this matter.

Sincerely,

James A. Saric
Remedial Project Manager
Federal Facilities Section
SFD Remedial Response Branch #2

Enclosure

cc: Tom Schneider, OEPA-SWDO
Bill Murphie, U.S. DOE-HDQ
John Bradburne, FERMCO
Terry Hagen, FERMCO
Tom Walsh, FERMCO

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TECHNICAL REVIEW COMMENTS ON "RTRAK APPLICABILITY STUDY"

GENERAL COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Not Applicable (NA) Page #: NA Line #: NA
Original General Comment #: 1
Comment: The accuracy, reliability, and applicability of the measurements made by the Radiation Tracking System (RTRAK) are in question because the technology is unproven. To date, the Department of Energy (DOE) has not adequately addressed the limitations of this developmental technology or provided a thorough justification for using it to evaluate waste acceptance criteria (WAC) attainment. However, DOE intends to use RTRAK measurement results as an integral part of the soils project. The study should be revised to address the limitations of the technology in terms of its proposed application for the soils project.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA
Original General Comment #:2
Comment: According to the study, the RTRAK was calibrated against the high-purity germanium detector (HPGe), as detailed in Section 3.0. This calibration was then field-verified against other HPGe results as discussed in Section 4.3. However, like the RTRAK, the HPGe is a developmental technology, so the entire study has limited validity. The study should be revised to present comparisons of RTRAK results to laboratory-derived results. If the RTRAK results are not directly compared to laboratory-derived results, then a propagation of error analysis should be included in the study to fully assess the accuracy of the RTRAK results.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA
Original General Comment #: 3
Comment: The study generally omits mention of limitations and potential limitations of the RTRAK. The study does discuss the currently limited calibration range, the minimal detectable concentrations (MDC), and the problem of "shine." However, in addition to the RTRAK's accuracy (as discussed in Original General Comments No. 1 and 2), the study should discuss potential RTRAK limitations under the following conditions: irregular terrain (including slopes and structures as found in the former production area), various

weather and soil conditions (especially moisture in the form of flood and rain), and temperature variations.

SPECIFIC COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3 Page #: 3-1 Line #: General
Original Specific Comment #: 1
Comment: This section discusses the relationship between the activities reported by the RTRAK and those reported by the HPGe for various isotopes. However, it presents numerical results (correlation coefficients) for only thorium-232 and radium-226. It should also present the correlation coefficients for the two other isotopes discussed, uranium-238 and potassium-40, so the relative accuracy of the RTRAK results for all isotopes of concern can be assessed.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.1 Page #: Figure 4-2B Line #: NA
Original Specific Comment #: 2
Comment: The figure and the associated data tables in Appendix C show very few data points in areas A-37 and A-38. However, Figure 4-2A shows no such data gap for a different series of measurements. This discrepancy should be explained.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.1.3.4 Page #: 4-9 Line #: 27
Original Specific Comment #: 3
Comment: The text states that the 8-second data acquisition period has a higher minimum detectable activity than the 2-second acquisition period. This statement should be revised to be consistent with text presented in Section 4.1.3.3.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3 Page #: 4-16 Line #: NA
Original Specific Comment #: 4
Comment: The text discusses the accuracy of the field studies. However, it compares the RTRAK only to the HPGe. As noted in Original General Comment No. 2, RTRAK results should be compared to definitive, laboratory-derived results.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.2 Page #: 6-2 Line #: NA
Original Specific Comment #: 5
Comment: The text discusses use of the RTRAK to determine whether soil meets the as low as reasonably achievable (ALARA) goal for uranium. Based on the MDC data in Section 4.2, such use of the RTRAK does not appear to be very practical because of the large relative error for

readings near the MDC. This RTRAK limitation should be explicitly discussed in the study.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 6.4 Page #: 6-4 Line #: 26
Original Specific Comment #: 6
Comment: The text states that the "hot spot" criterion is three times the final remediation level (FRL). However, the Area 1, Phase I certification report dated June 1997 uses twice the FRL as the criterion for a hot spot. The text of Sections 6.3 and 6.4 as well as Tables 6-1 and 6-3 and Figure 6-7 should be revised to reflect the hot spot criterion actually being used.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.1.1 Page #: 7-1 Line #: 24
Original Specific Comment #: 7
Comment: The text discusses the problem of "shine," or scattered radiation from nearby major sources. This discussion would be enhanced by an actual example of shine. The WAC attainment report for Area 1, Phase I, west stockpile dated June 1997 includes a mention of shine from a thorium storage facility. This example or a similar one should be included in Section 7.1.1.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 7.3 Page #: 7-3 Line #: 2
Original Specific Comment #: 8
Comment: The text of this bullet notes that the RTRAK was calibrated against the HPGe. It should also note that this calibration has not been verified using definitive laboratory results.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix A, Section A.5
Page #: A-6 Line #: 28
Original Specific Comment #: 9
Comment: The text states that peaks are wider at higher energy because resolution increases with energy. Actually, resolution is an inverse function of peak width, so a wide peak will have lower resolution. The text should be revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix B Page #: B-1 Line #: 2
Original Specific Comment #: 10
Comment: The text states that the hot spot criterion is three times the FRL. As noted in Original Specific Comment No. 6, the actual hot spot criterion is twice the FRL. Appendix B should be revised accordingly.